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AUTHOR Dalton, Marie
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ABSTRACT

Variables associated with interpersonal distance were studied in this research project. Since close physical proximity may produce defensive behaviors that are disruptive tc learning, instructors must be aware of the combinations of variables that produce the need for increased interpersonal distance in instructor-student interactions. A demographic questionnaire and the modified comfortable Interpersonal Distance Scale were administered. Data from the CID were analyzed by analysis of variance with repeated measures on three measures. Hypotheses accepted were that students will maintain less distance from their instructors in interactive classes than in lecture classes, from female instructors than from male instructors, and from black instructors than from white instructors. Also accepted were the hypotheses that white students will maintain less distance from instructors than will blacks, black students will permit black instructors closer than white students, and male students will permit female instructors closer than male instructors. (Author/LBH)

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INTERPERSONAL DISTANCING BETWEEN UNDERGRADUATE COLLEGE STUDENTS AND THEIR INSTRUCTORS*

The teaching-learning process is essentially one of communication. While researchers have given much attention to verbal communication in classroom settings, only recently have they begun considering the impact of nonverbal communication on classroom climate. Nonverbal communication is only one part of the total communication process, but it is an important part. By nonverbal communication is meant the process by which meanings are exchanged between individuals through a common system of nonverbal symbols--body movements, postures, positions, gestures, facial expressions, tone and quality of voice, visual contact, environmental cues, and proxemics.

The intent of the present research was to study variables associated with the dimension of nonverbal communication called proxemics, especially interpersonal distance. This dimension has been studied frequently outside the classroom but has been for the most part ignored as an area of research within the classroom.

Researchers have conceptualized spacing between people in numerous ways; however, the present investigation is concerned with Duke and Nowicki's (1972) concept of interpersonal distance, as it seems to represent best the dimension under study here. They conceived of interpersonal distance as

> An infinite series of oscillating rings represented in all planes (thus forming a globe). These rings are not necessarily circular but may be ovoid or elliptical. . . . These rings expand and contract, distances increase or decrease as functions of . . . numerous systematically manipulable, predictable, and measurable factors. (p. 120)

Factors which have been found to relate to the construct proxemics include race, sex, status, and affiliation. Specifically, in the college classroom, these might include race of instructor, race of student, sex of instructor, and sex of student. Additionally, the status and affiliation relationship between the instructor and student is probably related to the organizational pattern or class structure. One class may be structured in such a way that the primary mode of instruction is lecture--the instructor lectures to the class as a whole, with little if any one-to-one instructor-student verbal interaction taking place. Another class, on the other hand, may be interactive in that the primary mode of instruction requires the instructor to interact on a one-to-one basis with students. In the first instance, the instructor

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and individual students probably maintain greater physical distance since the instructor is more likely to remain in the front of the room. Closer physical proximity is usually at the student's initiation, as when he approaches the instructor after class to discuss a class-related problem. In the second kind of class structure, the instructor usually roams around the room to help students on an individual basis (as in a typewriting class or an engineering laboratory), and the instructor more likely initiates the close physical proximity.

The question which arises then is "Are there variables or combinations of variables which produce the need for different interpersonal distances in instructor-student interactions?" The problem becomes one of obtaining measures of interpersonal distance in various classroom situations.

Significance of the Study

Two outcomes of proxemic relationships have been identified by proxemic researchers. A growing body of literature suggests that close physical proximity demonstrates warmth and interest; yet another body of literature suggests that close physical proximity may produce defensive behaviors to protect from further invasion of personal space. Studies have shown that "flight" rather than "fight" is the usual reaction to personal space invasion in man (Felipe & Sommer, 1966; Garfinkel, 1964; Little, 1965; McDowell, 1969).

A paucity of research exists on personal space invasion in an ongoing superior-subordinate dyadic relationship such as the instructor-student relaship, and no one has systematically considered boundary variation in the classroom. Yet, such information is greatly needed. Because of the nature of courses taught and teaching methods used, instructors are frequently working individually with students at very close range. For example, the foreign language instructor often needs to demonstrate use of earphones while the student is in the carrel. The positioning here is likely to be the instructor actually standing over the student--almost touching or perhaps even touching. The music instructor may do the same when helping the music student acquire a comfortable position for playing an instrument. The accounting instructor frequently leans over the student and his work, perhaps assisting the student in finding errors. The examples are endless, but the point is that instructors are not always aware of the effect this proximity produces in the student.

Theoretical Concerns

Like many other aspects of human behavior, a minor controversy exists regarding human spatial behavior, a controversy which centers around the "nature-nurture" issue. Some researchers--for example, ethologists such as Eibl-Eibesfelt (1970, p. 444)--argue that human beings have certain needs for space which are based on an "innate disposition" and whose fulfillment is necessary for well being. Although man largely creates his own environment, its structure is in line with his biological constitution (Sommer, 1966). As do most vertebrates, man exhibits distinct territorial behavior; that is,

individuals maintain distinct interpersonal distances. The specific distances people permit between themselves and others are determined by various cultural patterns. Eibl-Eibesfelt postulates that "cultural rites are probably often developed upon the basis of innate learning dispositions" (1970, p. 454). That is where the "nurture" side of the issue arises; the question becomes one of determining cultural rites dealing with space and learning which aspects of human culture nurture the development of individual spatial needs.

Anthropologists, psychologists, and sociologists have identified numerous rites dealing with interpersonal space in general. Some have examined spacing where race is a factor or sex is a factor; other have examined spacing where status is a factor; and still others have investigated spacing in affiliative relationships.

Race and Distance

The impact of race on distancing is not clear, as research has produced contradictory results. For example, one researcher (Baxter, 1970) found that pairs of Chicanos stood closer together than did whites and that whites stood closer than did blacks. On the other hand, another researcher (Bauer, 1973) found that white males maintained the most distance and white females next; black males maintained middle distance; and black females were most proximal. In general, however, most research seems to point to the conclusion that "people maintain greater distance from persons of a different race" (Duke and Nowicki, 1972, p. 125).

Sex and Distance

Research findings on the relationship of sex of interactants and distance appear to be nonconclusive. While this relationship has been frequently investigated, results have often been contradictory. Hall (1959, 1966) suggested that different norms may exist for interaction distance for females and males in various cultures. Sommer (1959), Elkin (1964), Garfinkel (1964), Norum (1966), and Little (1968) reported that females tolerate closer physical presence than do males. Horowitz et al. (1964) and Forston (in Knapp, 1972, p. 42), however, found no sex differences.

In general, however, interpersonal distance appears to be influenced by sex. "Male-female pairs require less personal space than female-female pairs who in turn require less than male-male pairs" (Evans and Howard, 1973, p. 337).

Status and Distance

In the American culture, status appears to be associated with spacing. "Generally those with higher status have more and better space and greater freedom to move about" (Knapp, 1972, p. 43). How this occurs was dramatically illustrated in Theodore White's description of one incident of campaign workers' behavior around John Kennedy. Rushing forward to congratulate him, they suddenly stopped about 30 feet away and maintained that distance. Only those of higher status moved about freely closer to him.

Affiliation and Distance

Several researchers have considered the relationship between affiliation and distance. Evans and Howard (1973), in reviewing major findings on personal space, concluded that

> The preponderance of data suggest that persons who are friendly with each other or wish to communicate a positive affect will tend to interact at smaller interpersonal distances than those who are not friendly (p. 337).

Consideration of variables which have been found to be related to spacing is important in this study. They may be operating variables in the college classroom, where race of student and instructor, sex of student and instructor, and the relationship between the student and the instructor may, alone or together, produce the need for different interpersonal distances in instructor-student interactions.

Consideration of spacing rites between college students and their instructors implies an investigation of a rather complex theory, one that is multifaceted because of the numerous variables which may be operative in the student-instructor relationship.

Considering the undergraduate college classroom as a microculture, the classroom can be viewed as a status situation with the instructor being the high-status figure within the microculture. In the American culture, status is associated with greater space or distance. "Generally those of higher status have more and better space and greater freedom to move about" (Knapp, 1972, p. 43). Those of low status tend to respect the boundaries so that a high-status person is kept away.

Given information about status and spacing, several questions arise:

1. The first concerns the situation itself. If status can be diminished as a consideration in the situation, will spacing decrease? Status tends to create distance; the interactive class attempts to relax the traditional status structures and relationships of the lecture class; hence, the spacing between students and instructors in interactive classes should be less than in lecture classes.

2. The second question concerns the role of females and males in the American culture. Males have traditionally performed high-status roles and thus have been endowed with higher status than females. People tend to maintain distance from high status figures; thus, a reasonable expectation is that students will maintain greater distance from male instructors than from female instructors. In terms of "less space," then, will students maintain less distance from female instructors than from male instructors? Consideration of other roles of females in the American society reinforces this notion. People are socialized to like females; females are mothers, teachers, and other warm, nurturing roles in most people's early lives. Researchers have found that affiliation influences distance (Evans and Howard, 1973). Since people maintain less distance from those they like, and since most people have been socialized to like females, students should maintain less distance from female instructors than from male instructors.

3. The third question concerns the role of blacks and whites in this culture. Whites, like males, have traditionally performed high status roles and thus have been endowed with higher status than blacks. People tend to maintain distance from high status figures; thus, a reasonable expectation is that students will maintain greater distance from white instructors than from black instructors. Phrasing the question in terms of "less space" to be consistent with the previous questions then, will students maintain less distance from black instructors than from white instructors?

4. Considering the low-status roles of blacks and females in the American culture leads to another question concerning their uses of space. As stated earlier, people of lower status tend to respect the spatial boundaries of higher-status persons by maintaining greater distance. Therefore, a reasonable expectation is that black students and female students will maintain greater distance from instructors than will white students and male students. Conversely, will white students and male students maintain less distance from instructors than will black students and female students?

The four questions posed so far are rather straightforward. Because of the numerous variables operative in the student-instructor relationship, other facets of the use of space in this relationship must be considered. These are questions 5 and 6.

5. The matters of race and affiliation have been touched on in two ways thus far: Whites are traditionally high status and blacks low status; and, affiliation results in proximity. The matters of race and affiliation can now be combined. "Physical attractiveness plays an influential role in determining responses for a broad range of interpersonal encounters" (Knapp, 1972, p. 64). One theoretical argument is that people like other people who look like them. Extending this to racial characteristics, a logical expectation is that whites should find whites more attractive, and blacks should find blacks more attractive. Since affiliation affects proximity, will students maintain less distance from instructors of the same race than from instructors of a different race; i.e., will white students permit white instructors closer than black instructors and will black students permit black instructors closer than white instructors? Complicating this question is the third question above: Will students maintain less distance from black instructors than from white instructors (assuming that whites have traditionally been accorded higher status, and thus may be accorded more space). The complication may be envisioned in this way:

White students may maintain less space from white instructors because of general attractiveness and affiliation. On the other hand, they may maintain more distance from white instructors because of status.

A further possible complication is an interesting phenomenon observed in recent years:

> There is almost a "boomerang" effect sometimes with the black person still judged only by his skin color, but the judgment is indiscriminately positive instead of negative. Some explain this phenomenon as an overreaction caused by widespread guilt feelings among whites (Knapp, 1972, p. 76).

If this phenomenon occurs in the classroom, it would result in white students maintaining less distance from black instructors simply because they are black; and this would complicate the same-race, less-distance expectation.

6. Another aspect of attraction in any relationship is that of sexual attraction. People are generally attracted to those of the opposite sex. Because attraction and affiliation result in proximity, a reasonable expectation is that males will permit females closer and females will permit males closer. Does this hold true in the classroom? Will students maintain less distance from instructors of the opposite sex? Again, a complication arises in answering this question if the second question posed earlier is reconsidered; that is, will students maintain less distance from female instructors than from male instructors (assuming males are viewed as high-status persons whom others permit more space)? The complication for female students is to maintain less distance from male instructors because of sexual attractiveness while maintaining greater distance from male instructors because of their status.

Since the socialization process appears to be a great influence, certain factors in that process seem worthy of investigation:

1. The cultural groups in which one holds memberships have previously been suggested in the forms of race and sex.

2. Since the process of socialization involves time and experience, age may be a factor. The rapidly changing social climate may influence different age groups to accept different interpersonal distances.

3. The primary agent of socialization is the family; certain factors within this unit may bear on development of spatial expectations. These factors are family size, one's age in relation to siblings, and family economic status.

4. Early experiences seem to be most crucial in human development; in fact, distancing norms appear to be determined by the age of twelve years. Because spacing rites appear to vary with cultures and even with subcultures, the culture in which one spends those first twelve years may be an important factor. A person's behavior is expected to be congruent with the culture of which he is a member.

Purpose of the Study

The purpose of this study was to investigate variables associated with interpersonal distancing in the college classroom. The hypotheses studied were the following:

Hypothesis 1. Students will maintain less distance from their instructors in interactive classes than in lecture classes.

Hypothesis 2. Students will maintain less distance from female instructors than from male instructors.

Hypothesis 3. Students will maintain less distance from black instructors than from white instructors.

Hypothesis 4. (a) White students will maintain less distance from instructors than will black students, and (b) male students will maintain less distance from instructors than will female students.

Hypothesis 5. Students will maintain less distance from instructors of the same race than from instructors of a different race; (a) white students will permit white instructors closer than black instructors, and (b) black students will permit black instructors closer than white instructors.

Hypothesis 6. Students will maintain less distance from instructors of the opposite sex: (a) male students will permit female instructors closer than male instructors, and (b) female students will permit male instructors closer than female instructors.

METHOD

A modified version of the Comfortable Interpersonal Distance Scale (Appendix A) was used to collect data. Data consisted of student responses to eight stimuli (instructors); students indicated on an 80-mm line (representing an entrance into a classroom at one end of the line and the spot where they were sitting at the other end) the point at which they would want certain instructors to stop approaching them so that they could continue to feel comfortable. The eight instructors were the following. Order had been randomly determined.

1. black male instructor in an interactive class
2. white female instructor in an interactive class
3. black female instructor in an interactive class
4. black female instructor in a lecture class
5. white male instructor in an interactive class
6. white male instructor in a lecture class
7. black male instructor in a lecture class
8. white female instructor in a lecture class

Additionally, respondents provided demographic data in the form of questions relating to sex, race, age, number and ages of siblings, family economic status, and location of domicile during first twelve years of their life (Appendix B).

A pilot study was conducted to refine procedures and to determine whether order of presentation influenced responses.

The data were collected in classes randomly selected from two class lists: the University of Houston Central Campus Spring 1976 class schedule and the University of Houston Central Campus Afro-American Studies Program class schedule. The sample consisted of fifty black male students, fifty black female students, fifty white male students, and fifty white female students.

The data collected were analyzed by performing an analysis of variance with repeated measures on three variables which determined the effect of each

independent variable by itself (mode of instruction, sex of instructor, sex of student, race of instructor, and race of student) or the interaction of the variables on the dependent variable (measure of interpersonal distance).

Where an interaction was found to be significant, Tukey's Honestly Significant Difference Test was done.

RESULTS AND DISCUSSION

Table 1 shows the means and standard deviations across categories (in mm). (The ranges of these categories are shown in Appendix C.) Data from this table were collapsed for discussion of the hypotheses.

Table 2 shows the calculations of the F ratios and their comparison to an F table. In this study four of the five main effects were significant: race of student, sex of instructor, race of instructor, and mode of instruction. Had no intereaction been found to exist, interpretation would have been clear. However, because some interactions were significant, the outcomes of the tests for main effects became clouded. Therefore, only hypothesized findings and two-way interactions are discussed herein.

Table 3 is the summary table of hypothesized results and significant interactions that are discussed herein.

Discussion of Results

Tables 1 and 2 are discussed in light of specific research hypotheses. Table 1 shows the means and standard deviations across categories of subjects, and Table 2 presents F values for the analysis of variance of the interpersonal distance measures. To avoid logical inconsistencies, some hypotheses and unhypothesized two-way interactions are discussed together. These discussions are grouped by variable: mode of instruction, sex, and race.

Mode of Instruction

Main Effect: Hypothesis 1. Students will maintain less distance from their instructors in interactive classes than in lecture classes. The analysis of variance data from Table 2 indicate a significant mode of instruction effect, $F(1,196) = 81.18$, $p < .01$.

Collapsing data in Table 1 indicates the mean distance measures of all students in interactive classes (25.4 mm) and in lecture classes (33.7 mm). Therefore, the research hypothesis is accepted.

Results. These means indicate that in general students tend to maintain less distance between themselves and instructors in interactive classes than in lecture classes.

Discussion. Personal space appears not be fixed; rather, it seems to be flexible and its size can be manipulated. One way that the size of students'

Table 1

Interpersonal Distance

Means and Standard Deviations Across Categories[a,b]

(in mm)

Students		Instructors: Male / Black / Lecture Class	Male / Black / Interactive Class	Male / White / Lecture Class	Male / White / Interactive Class	Female / Black / Lecture Class	Female / Black / Interactive Class	Female / White / Lecture Class	Female / White / Interactive Class
Female	White	Mean = 36.02 S.D. = 17.03	Mean = 25.78 S.D. = 17.56	Mean = 29.78 S.D. = 16.94	Mean = 20.04 S.D. = 14.07	Mean = 34.10 S.D. = 17.60	Mean = 23.83 S.D. = 15.19	Mean = 31.86 S.D. = 17.61	Mean = 21.70 S.D. = 16.02
	Black	Mean = 28.44 S.D. = 19.09	Mean = 21.12 S.D. = 17.80	Mean = 42.84 S.D. = 23.68	Mean = 39.50 S.D. = 20.45	Mean = 31.20 S.D. = 19.42	Mean = 24.98 S.D. = 17.26	Mean = 41.92 S.D. = 22.54	Mean = 34.94 S.D. = 19.50
Male	White	Mean = 30.44 S.D. = 16.99	Mean = 23.22 S.D. = 19.61	Mean = 31.92 S.D. = 17.48	Mean = 24.72 S.D. = 18.37	Mean = 29.68 S.D. = 16.86	Mean = 23.52 S.D. = 16.99	Mean = 26.58 S.D. = 18.63	Mean = 20.42 S.D. = 16.22
	Black	Mean = 34.74 S.D. = 19.14	Mean = 23.40 S.D. = 16.81	Mean = 47.46 S.D. = 17.62	Mean = 36.44 S.D. = 20.85	Mean = 27.02 S.D. = 19.89	Mean = 14.90 S.D. = 12.79	Mean = 36.32 S.D. = 21.47	Mean = 27.14 S.D. = 20.84

[a] n = 50 for each category.

[b] The ranges of these categories are shown in Appendix E.

Table 2

Analyses of Variance:

Interpersonal Distance Measures

Source	df	SS	MS	F
Race of Student (2)[a]	1	9,890.3	9,890.31	*6.41
Sex of Student (3)	1	1,493.8	1,493.83	.97
Race of Instructor (4)	1	10,050.1	10,050.08	**29.95
Sex of Instructor (5)	1	3,158.4	3,158.45	**20.89
Mode of Instructor (6)	1	27,922.4	27,922.41	**81.18
Interaction (2 x 3)	1	24.0	24.0	.02
Within sets (1 within 2, 3)	196	302,561.0	1,543.68	
Within sets (1 x 4 within 2, 3)	196	65,771.5	335.57	
Interaction (2 x 4)	1	22,921.9	22,921.89	**68.31
Interaction (3 x 4)	1	59.3	59.27	.18
Interaction (2 x 3 x 4)	1	52-.2	522.17	1.56
Within sets (1 x 5 within 2, 3)	196	29,631.9	151.18	
Interaction	1	1,079.1	1,079.10	**7.14
Interaction (3 x 5)	1	3,416.4	3,416.40	**22.60
Interaction (2 x 3 x 5)	1	1,281.7	1,281.65	**8.48
Within sets (1 x 6 within 2, 3)	196	67,413.1	343.94	
Interaction (2 x 6)	1	2.1	2.09	.01
Interaction (3 x 6)	1	44.3	44.22	.13
Interaction (2 x 3 x 6)	1	1,857.6	1,857.62	*5.40
Within sets (1 x 4 x 5 within 2, 3)	196	19,039.0	97.14	
Interaction (4 x 5)	1	455.8	455.80	*4.69
Interaction (2 x 4 x 5)	1	388.1	388.14	*4.00
Interaction (3 x 4 x 5)	1	98.0	98.03	1.01
Interaction	1	891.0	890.98	**9.17
Interaction (4 x 6)	1	103.0	103.01	1.50
Within sets (1 x 4 x 6 within 2, 3)	196	13,479.0	68.77	
Interaction	1	39.7	39.74	
Interaction (3 x 4 x 6)	1	.1	.10	.00
Interaction (2 x 3 x 4 x 6)	1	.2	.17	.00
Interaction (5 x 6)	1	.6	.64	.01
Within sets (1 x 5 x 6 within 2, 3)	196	15,727.0	80.24	
Interaction	1	7.0	7.04	.09
Interaction	1	41.6	41.59	.52
Interaction	1	5.3	5.28	.07
Interaction (4 x 5 x 6)	1	17.2	17.24	.29
Within sets (1 x 4 x 5 x 6 within 2, 3)	196	11,529.8	58.83	
Interaction (2 x 4 x 5 x 6)	1	.8	.77	.01
Interaction	1	70.6	70.55	1.20
Interaction	1	95.1	95.08	1.62

[a]Numbers in parentheses designate the symbol for the variable named; the number 1 refers to subjects.

*$p < .05 = 3.90$.

**$p < .01 = 6.77$.

Table 3

Summary of Hypothesized Results

and Significant Interactions--

Analyses of Variance:

Interpersonal Distance Measures

Source	df	SS	MS	F
Race of Student (2)[a]	1	9,890.3	9,890.31	*6.41
Sex of Student (3)	1	1,493.8	1,493.83	.97
Race of Instructor (4)	1	10,050.1	10.050.08	**29.95
Sex of Instructor (5)	1	3,158.4	3,158.45	**20.89
Mode of Instruction (6)	1	27,922.4	27.922.41	**81.18
Interaction (2 x 4) rs x ri	1	22.921.9	22.921.89	**68.31
Interaction (2 x 5) rs x si	1	1,079.1	1,079.10	**7.14
Interaction (3 x 5) ss x si	1	3,416.4	3,416.40	**22.60
Interaction (4 x 5) ri x si	1	455.8	455.80	*4.69

[a]Numbers in parentheses designate the symbol for the variable named; the number 1 refers to subjects.

*$p < .05 = 3.90$.

** $p < .01 = 6.77$.

personal space can be manipulated appears to be by varying the mode of instruction. Lecture is one mode of instruction while interaction is another. Apparently, differences exist between the interactive class and the lecture class that cause spatial boundaries to change. Differences between the two modes of instruction include different communication patterns, varied physical environments, and different perceptions.

Communication barriers seem to be lowered in the interactive class; certainly, the patterns of communication vary. In the lecture class, verbal communication usually flows from the instructor to the class as a whole. In the interactive class, the communication flow may be from the instructor to one student; from one student to another student, the instructor or a group of students; or some other combination. The physical environments in the lecture class and the interactive class usually differ. Sommer (1969) points out that the usual spatial layout of straight rows of chairs oriented toward the teacher suggests on a nonverbal level the authority-oriented flow of communication from teacher to student. In the interactive class, students may be in circles, on the floor, in small groups, or other arrangements; this spatial freedom results in more fluid interaction patterns and, hence, probably, impacts on spacing.

Student perceptions may vary, depending on whether the class is lecture or interactive. The permission, and even encouragement, students receive to interact more verbally may carry with it an implied permission to interact more closely physically. Students' views of authority may also vary; with the interaction may come a perception of shared authority. The role of the instructor may be perceived as friendlier and less authoritative and perhaps, therefore, less threatening.

Additionally, because eye contact is valued in the American society, students may expect interaction to take place at a closer distance so that increased eye contact is possible.

Sex

Main Effect: Hypothesis 2. Students will maintain less distance from female instructors than from male instructors. The analysis of variance data from Table 2 indicate a significant sex of instructor effect, F (1, 196) = 20.89, $p < .01$.

Collapsing data in Table 1 indicates the mean distance measures of students from female instructors (28.1 mm) and from male instructors (30.9 mm). The research hypothesis is accepted.

Results. These means suggest that students (considered as a group and not broken down into racial or sexual categories) maintain less distance from female instructors than from male instructors.

Main Effect: Hypothesis 4b. Male students will maintain less distance from instructors than will female students. The analysis of variance indicates a nonsignificant sex of student effect, F (1, 196) = .97, $p > .05$.

Collapsing data in Table 1 indicates the mean distance measures of male students (28.6 mm) and of female students (30.5 mm) from all instructors. Therefore, the research hypothesis is not supported.

Results. These means suggest that male and female students maintain approximately the same distance from instructors in general.

Interaction Effect: Hypothesis 6. Students will maintain less distance from instructors of the opposite sex: (a) male students will permit female instructors closer than male instructors, and (b) female students will permit male instructors closer than female instructors. The analysis of variance indicates a significant interaction effect of sex of student and sex of instructor, F (1, 196) = 22.6, $p < .01$.

Collapsing data in Table 1 yields the mean distance measures depicted in Figure 1.

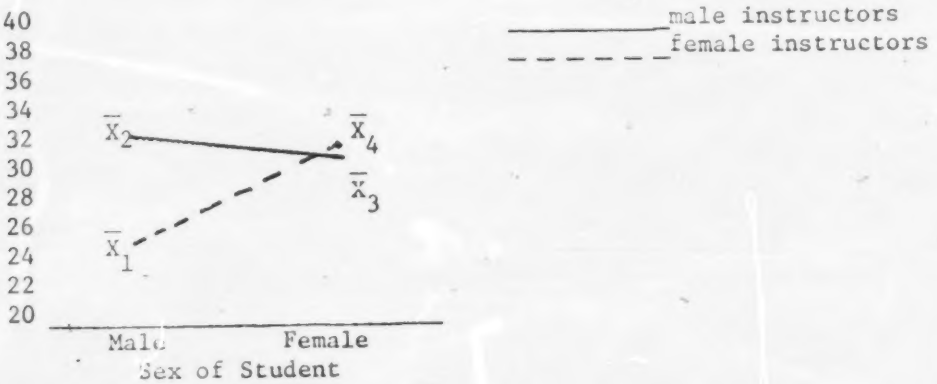


Figure 1. Mean distances maintained from male instructors and female instructors by male students and female students.

Tukey multiple comparisons are presented in Appendix D, Table D.1.

Results. These data indicate that male students tend to permit female instructors closer than male instructors but that female students do not differentiate between female instructors and male instructors in their spacing.

Discussion. These results support the idea that personal space is not fixed; sex appears to be a variable which influences spacing between undergraduate college students and their instructors. Its influence is seen in the following ways: Students in general maintain less distance from female instructors than from male instructors. Male and female students maintain approximately the same distance from instructors in general. Male students permit female instructors closer than male instructors; female students do not differentiate between male instructors and female instructors.

Several factors may account for these results. People are generally attracted to those of the opposite sex, and attraction and affiliation result in closer proximity. However, the cross-sex preference may be operative primarily in relations involving male students and female instructors only;

female students may be concerned about sexual overtones and/or status differential and therefore may, for comfort's sake, prefer that male instructors stay as far away as female instructors. Garfinkel (1964) has reported that when spatial violation occurs, the victim may consider sexual intent to be the motivating force behind the violator's behavior. Female students may desire proximity with male instructors (because of the cross-sex attractiveness) but may have a concurrent desire for greater space from male instructors because of a perceived status differential. Males have traditionally been accorded higher authority and status than females. While societal views are changing, tradition dies slowly; many undergraduates were reared with the traditional viewpoint, unconsciously or otherwise. Because persons perceived to be of higher status or authority are generally allowed more space, the effect of a status differential in female student-male instructor interactions is to offset any existing cross-sex attractiveness.

Garfinkel's "sexual intent" theory may also account for the greater distance male students prefer from male instructors (as compared to their distance from female instructors); male students may be concerned about homosexual appearances and, therefore, may feel more comfortable with greater distance between themselves and male instructors.

Attraction and affiliation may enter as factors in spacing in a second way (in addition to the cross-sex preference), this time as feelings for females. Females have traditionally filled warm, nurturing, supportive roles in most people's lives. These feelings may carry over into the classroom, where female instructors are endowed with positive affect, resulting in students desiring proxemic relations with them in general. Attraction to females may be valid for males and females; but, because of the "sexual intent" theory and concern about homosexual appearances, female students may be uncomfortable with physical closeness to female instructors. The attraction and the discomfort may, therefore, negate each other so that female students maintain approximately the same distance from female instructors as they do from male instructors.

Race

Main Effect: Hypothesis 3. Students will maintain less distance from black instructors than from white instructors. In Table 2, the analysis of variance indicates a significant race of instructor effect, F (1, 196) = 29.95, $p < .01$.

Collapsing data in Table 1 indicates the mean distance measure of all students from white instructors (32.0 mm) and from black instructors (27.0 mm). Therefore, the research hypothesis is accepted.

Results. These means suggest that students (considered as a total group) maintain less distance from black instructors than from white instructors.

Main Effect: Hypothesis 4a. White students will maintain less distance from instructors than will black students. The analysis of variance reported in Table 2 indicates a significant race of student effect, F (1, 196) = 6.41, $p < .05$.

Collapsing data in Table 1 gives mean distance measures of white students (27.0 mm) and of black students (32.0 mm). Therefore, the research hypothesis is accepted.

Results. These means suggest that white students (considered as a total group) maintain less distance from instructors than do black students.

Interaction Effect: Hypothesis 5. Students will maintain less distance from instructors of the same race than from instructors of a different race: (a) white students will permit white instructors closer than black instructors, and (b) black students will permit black instructors closer than white instructors. In Table 2 the analysis of variance indicates a significant interaction effect of race of student and race of instructor, F (1, 196) = 68.31, $p < .01$.

Collapsing data in Table 1 indicates the mean distance measures depicted in Figure 2.

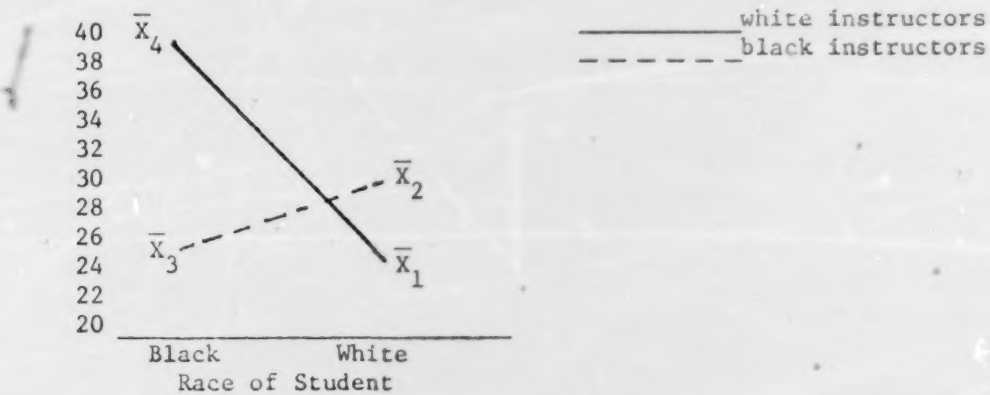


Figure 2. Mean distances maintained from black instructors and white instructors by black students and white students.

Tukey multiple comparisons are presented in Appendix D, Table D.2.

Results. These means indicate that black students differentiate between black instructors and white instructors, allowing black instructors closer; however, white students permit white instructors and black instructors at approximately the same distance.

Interaction Effect: Race of Student by Sex of Instructor. In Table 2, the analysis of variance indicates a significant interaction effect of race of student and sex of instructor, F (1, 196) = 7.14, $p < .01$.

Collapsing data in Table 1 indicates the mean distance measures depicted in Figure 3.

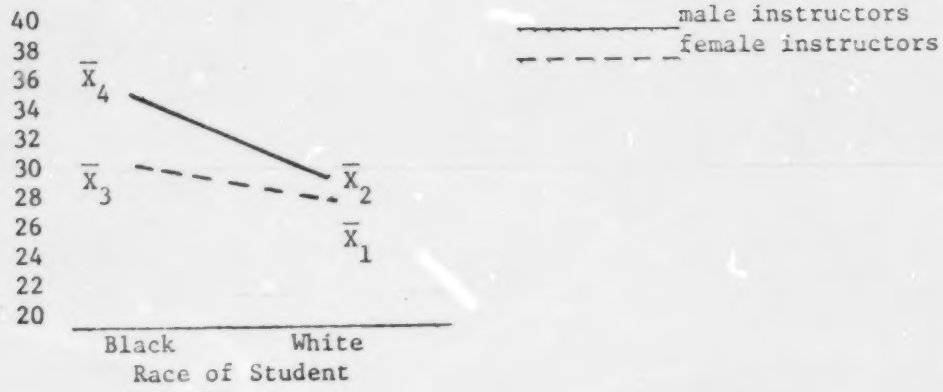


Figure 3. Mean distances maintained from male instructors and female instructors by black students and white students.

Tukey multiple comparisons are presented in Appendix D, Table D.3.

Results. These means suggest that black students maintain greater distance from male instructors than from female instructors; but, white students do not differentiate between male instructors and female instructors.

Interaction Effect: Race of Instructor by Sex of Instructor. In Table 2, the analysis of variance indicates a significant interaction effect of race of instructor and sex of instructor, F (1, 196) = 4.69, $p < .05$.

Collapsing data in Table 1 indicates the mean distance measures depicted in Figure 4.

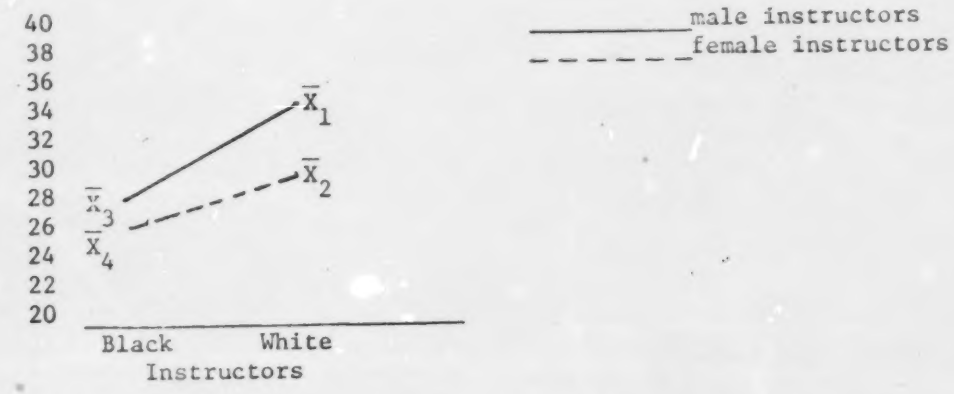


Figure 4. Mean distances maintained from black female instructors, black male instructors, white female instructors, and white male instructors.

Tukey multiple comparisons are presented in Appendix D, Table D.4.

Results. These means indicate that (1) students (considered as a total group) maintain greater distance from white male instructors than from white

female instructors and (2) they permit black male instructors and black female instructors at approximately the same distance.

Discussion. Like mode of instruction and sex of interactants, race appears to be a variable which influences spacing between undergraduate college students and their instructors. The influence of race is seen in the following ways: Students (as a total group) maintain less distance from black instructors than from white instructors. White students maintain less distance from instructors than do black students. Black students differentiate between black instructors and white instructors, allowing black instructors closer; however, white students permit white instructors and black instructors at approximately the same distance. Black students maintain greater distance from male instructors than from female instructors; but, white students do not differentiate between male instructors and female instructors. Students (as a total group) maintain greater distance from white male instructors than from white female instructors, but they permit black male instructors and black female instructors at approximately the same distance.

Several factors may account for these results. Whites, like males, have traditionally performed high status roles and thus have been endowed with higher status than blacks. Because people tend to maintain distance from high status figures, this may explain why students in general maintain less distance from black instructors than from white instructors.

In the classroom, the instructor may be viewed as the authority or status figure. Space appears to be positively correlated with status discrepancy when the status of the one perceived is higher; assuming this and the difference in status of black students as perceived by black students may explain why black students maintain more distance from instructors than do white students.

People are generally attracted to those of the same race, and attraction and affiliation result in closer proximity; however, the same-race preference may be operative primarily in interactions involving black students and black instructors only. White students in this study did not differentiate between black instructors and white instructors. Two possible explanations exist as to why white students maintained about the same distance from black instructors as they did from white instructors: White students may desire greater distance from black instructors (because of the difference in race) but may have a concurrent feeling that close proximity is appropriate because of a perceived status differential (high status of whites, low status of blacks); these two distancings would, thus, negate each other. A second possible explanation is that the "boomerang" effect, as described by Knapp (1972), may be operative. He indicated that whites still judge blacks only by their skin color, but the judgment is indiscriminately positive rather than negative. This positive judgment may result in closer proximity.

The results of Hypothesis 2 showed that students (as a total group) maintain less distance from female instructors than from male instructors. However, considering the interaction of race of student with sex of instructor showed that white students appear to be unaffected spatially by the sex of the instructor. Black students maintain greater distance from male instructors than from female instructors; but, white students do not differentiate between male instructors and female instructors. A possible explanation is that the

authority and status of the male instructor may be important to black students but not to white students.

When the interaction of race of instructor and sex of instructor was considered, results showed that while students in general maintain greater distance from white male instructors than from white female instructors, they do not differentiate between black male instructors and black female instructors. Apparently, the role of the white male instructor is perceived as warranting additional space. Perhaps the status of white males in authority positions is carried over from society in general. Additionally, students may view race (blackness) as overriding sex of instructor and do not differentiate between males and females except with white instructors.

Other Significant Interactions. Other interactions found to be significant were race of student by sex of student by sex of instructor, race of student by sex of student by mode of instruction, race of student by race of instructor by sex of instructor, and race of student by sex of student by race of instructor by sex of instructor.

Tukey multiple comparisons are presented in Appendix D, Tables D.5, D.6, D.7, and D.8.

No discussion is included because these were totally unexpected findings for which no hypotheses had been made.

CONCLUSIONS

1. Personal space appears not be fixed; rather, it seems to be flexible and its size can be manipulated. Factors that were found to impact on spacing were status, attraction, and affiliation.

2. From a theoretical standpoint, status as an explanation for spacing was partially supported; while it seemed to influence distancing between students and instructors, expectations did not always hold true. Its diminishment in the interactive class resulted in less space. It seemed to produce the expected result when the decreased perceived status was in the stimulus (as in the interactive class, the female instructor, the black instructor). It did not always produce the expected result when the hypothesis was based on the respondent perceiving herself as "lower status" (as in female students and their spacing from instructors as a group and their spacing from male instructors and their spacing from female instructors). However, perceived lower self-status as an explanation for spacing of black students seemed to hold true (in spacing from instructors as a group, in spacing from white instructors and black instructors, and in spacing from male instructors and female instructors.

3. Attraction and affiliation were also partially supported as influencers of spacing between undergraduate college students and their instructors. The affiliation for females produced through socialization seems to carry over into the classroom so that students in general permit female instructors closer than male instructors. While a cross-sex preference was investigated, it

was found to exist only for male students with female instructors. Similarly, while a same-race preference was investigated, it was found to exist only for black students with black instructors.

4. Garfinkel's theory of "sexual intent" in spatial violation gains importance in light of the results of this study. It may account for female students maintaining approximately the same distance from male instructors and female instructors and for male students preferring greater distance from male instructors.

5. The findings of the present study lend some support to Knapp's theory of a "boomerang" effect. He views this as a recent phenomenon in racial interactions, with the black person sometimes still judged only by his skin color; but the judgment is indiscriminately positive rather than negative. He attributes this phenomenon as an overreaction caused by widespread guilt feelings among whites. If this is assumed to be true, the likelihood exists that white students may be attempting to demonstrate positive feelings toward black instructors by close proximity.

6. While arguments have been raised as to the effectiveness of one class structure over another, to be remembered is that both the lecture class and interactive class are appropriate, depending on the situation. An instructor may decide, because of class size, instructional content, students' personalities or values, or a number of other reasons, that one method is more appropriate than the other. Caution must be exercised in choosing one method over the over so that the resulting effect is the one desired.

SPECULATIONS AND IMPLICATIONS

The previously presented conclusions are the basis for arriving at certain speculations and implications which can be supported by the data in this study. The following is a presentation of those speculations and implications.

1. Personal space is not fixed; rather, it appears to be flexible. Social differences among the four categories of subjects may account for some of the spatial differences found. An analysis of the demographic data revealed some of these social differences. Personality of instructors and students may be influential in student-instructor interactions. Duke and Nowicki (1972), in studying locus of control and spacing, reported that internals (people who feel they control their own fate) distance nonfamiliar authorities less than externals (those who perceive themselves as being controlled by forces outside themselves). This was also reported by Patterson and Holmes (1966), Patterson and Sechrest (1970), and Williams (1963). Present and recent past societal conditions may create more whites than blacks who are internals. Meisels and Cantor (1970), however, found no relationship. In that regard, Eberts (1972) found that persons who lived alone, saw their friends as conservatives, and had lower self-acceptance scores, preferred more personal space. The implication of this for classroom applications are important; two current contradictory positions in education are held: (1) that instructors should learn as much as possible about students' social backgrounds (to understand students better) and (2) that instructors should know little or nothing about

students' backgrounds (in order not to prejudge their abilities). If social differences prove to impact on spacing, then instructors may need information about students' social backgrounds in order to modify their behavior in student-instructor interactions.

2. Age may also produce different distancing norms and may explain some of the variability. An analysis of the demographic data showed that blacks were younger than whites in the sample (mean of black students = 20.9; mean of white students = 25.2). The standard deviations were 5.38 for white males, 6.93 for white females, 1.36 for black males, and 1.35 for black females. (Appendix E)

3. The threat of uninvited sexual advances may also be a factor in spacing between students and instructors. Garfinkel (1964) suggested that sexual intent may be considered by the "victim" to be the motivating force behind the violator's behavior. In the instructional setting, students may interpret an instructor's physical closeness as an indicator of sexual interest and may become uncomfortable. Instructors should be sensitive to possible discomfort in students of either sex.

4. Because of socialization, black students' views of authority probably differ from white students'. Certainly, their reactions differed to the authority figure as represented here by the instructor. A plausible speculation is that the changing social scene will produce changes within the next generation or two of black students. Some aspects of the social scene which may impact directly or indirectly on how individuals perceive themselves include, in addition to racial equality, broadening personal freedoms, sexual freedom, and women's rights. The possibility also exists that counterforces may develop as a reaction to these changes which could make distances increase. The findings of this study represent information about the dynamics of human interactions, information that can be used to facilitate or hinder possible relationships in the classroom.

5. The difference in distance maintained in interactive classes and in lecture classes is dramatic enough to speculate that permission to interact has the same result as permission to maintain closer proximity. Mode of instruction affects spacing; the close psychological distance created by the interactive class encourages close physical interaction (breaking down communication barriers.) This difference also suggests that the authority figure is not the same in lecture and interactive classes. The instructor may use this information to create the psychological climate he desires or considers most effective in a particular situation.

6. Results of this study imply that black students appear to have the greatest sensitivity to spacing, particularly black male students. They maintained both the least distance and the greatest distance. Additionally, their spacing seems to be more predictable than the spacing of other categories of students, using the theoretical arguments presented in this study. An interesting speculation is whether blacks are more sensitive, in general, to all or other aspects of nonverbal communication and whether societal conditions have led them to develop a special awareness.

7. Personal space appears to be flexible. The results of this study lead to speculation of whether spacing reactions can be modified through training, such as role playing, and whether such modification has any advantages. While

this may not be important in the classroom setting, the possibility exists that it might be advantageous to develop tolerance to close proximity of authority figures in the work situation. (Such training could be beneficial to instructors also, as discussed below.)

8. Because the teaching-learning process is essentially one of communication, the quality of the communication contributes to the instructional climate. Interpersonal distancing is an important part of the total communication process.

Previous researchers have identified two outcomes of proxemic relationships: a demonstration of warmth and interest through close physical proximity, and defensive behaviors to protect from further invasion of personal space.

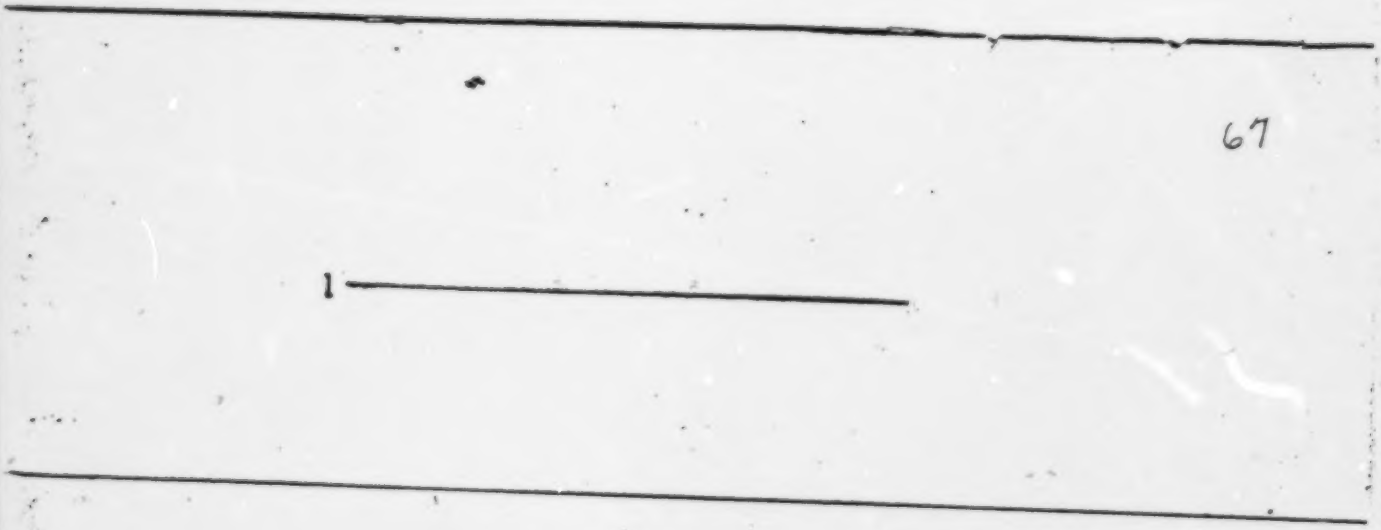
This study has shown that interpersonal distancing varies in instructor-student interactions. Instructors may need to keep this in mind when working with students. They may need to be aware of variables and combinations of variables which produce increased interpersonal distance and learn to recognize nonverbal cues in students that signal a desire for more or less proximal relations. Instructors themselves may initiate behaviors to decrease space by calling students by their first names, by encouraging discussion among and with students, by varying the physical environment, by varying eye contact, etc. Teacher training which includes this information could prove helpful to instructors in creating appropriate and effective instructional climates.

APPENDIX

APPENDIX A

COMFORTABLE INTERPERSONAL DISTANCE SCALE

(MODIFIED FORM)



The form consists of eight strips of paper like that shown above, numbered 1 through 8. The number in the right margin of the form is used to collate responses with questionnaires.

APPENDIX B

DEMOGRAPHIC QUESTIONNAIRE

To help complete this study, please provide the following information. Be assured that your responses will be held in strict confidence. Please check the appropriate answer and fill in where necessary.

---

1. What is your sex?

   Male _____
   Female _____

2. What is your race?

   White _____
   Black _____
   Other (please specify) _____

3. Please indicate the ages as of this date of all children in the family in which you were reared and circle your age.

   _____ _____ _____

   _____ _____ _____

4. When you were in elementary school, how would you rate the income level of the family in which you were reared?

   Poor _____
   Low middle _____
   Middle _____
   High middle _____
   Wealthy _____

5. Where did you spend most of the first 12 years of your life? Please indicate the state if in the U.S. or the country if outside the U.S.

   _____

*6. What is your ethnic background? Please specify (for example, Italian, German, etc.).

   _____

THANK YOU FOR YOUR ASSISTANCE.

*This question was thrown out of the study, as it lacks clarity.

APPENDIX C

Range of Interpersonal Distance Measures

(in mm) within Groups

Stimulus	White Male Subjects N = 50	White Female Subjects N = 50	Black Male Subjects N = 50	Black Female Subjects N = 50
Black Male Instructor in an Interactive Class	1 - 76 Range = 75	2 - 65 Range = 63	2 - 80 Range = 78	0 - 62 Range = 62
White Female Instructor in an Interactive Class	1 - 76 Range = 75	1 - 67 Range = 66	2 - 80 Range = 78	3 - 80 Range = 77
Black Female Instructor in an Interactive Class	5 - 78 Range = 73	3 - 69 Range = 66	1 - 56 Range = 55	4 - 73 Range = 69
Black Female Instructor in a Lecture Class	4 - 73 Range = 71	3 - 66 Range = 63	1 - 70 Range = 69	3 - 70 Range = 67
White Male Instructor in an Interactive Class	1 - 76 Range = 75	2 - 58 Range = 56	3 - 80 Range = 77	3 - 80 Range = 77
White Male Instructor in a Lecture Class	2 - 76 Range = 74	3 - 66 Range = 63	4 - 80 Range = 76	3 - 79 Range = 76
Black Male Instructor in a Lecture Class	1 - 76 Range = 75	3 - 68 Range = 65	2 - 78 Range = 76	3 - 72 Range = 69
White Female Instructor in a Lecture Class	2 - 76 Range = 74	3 - 78 Range = 75	1 - 80 Range = 79	4 - 80 Range = 76

APPENDIX D

TUKEY TESTS FOR SIGNIFICANT DIFFERENCES

Table D.1

Differences in Mean Distances for Interaction of Sex of Student by Sex of Instructor

	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	$\bar{X}_4$
male students with female instructors $X_1 = 25.7$		**5.7	**4.7	**4.9
male students with male instructors $X_2 = 31.4$			1.0	.9
female students with male instructors $X_3 = 30.4$				.1
female students with female instructors $X_4 = 30.6$				

**Significant differences at $p < .01$.

Table D.2

Differences in Mean Distances for Interaction of Race of Student by Race of Instructor

	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	$\bar{X}_4$
white students with white instructors $\bar{X}_1 = 25.8$		2.6	.1	**12.6
white students with black instructors $\bar{X}_2 = 28.3$			2.6	**10.0
black students with black instructors $\bar{X}_3 = 25.7$				**12.6
black students with white instructors $\bar{X}_4 = 38.3$				

**Significant differences at $p < .01$.

Table D.3

Differences in Mean Distances for Interaction of Race of Student by Sex of Instructor

	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	$\bar{X}_4$
white students with female instructors $\bar{X}_1 = 26.4$		1.2	*3.4	**7.8
white students with male instructors $\bar{X}_2 = 27.6$			2.2	**6.6
black students with female instructors $\bar{X}_3 = 29.8$				**4.5
black students with male instructors $\bar{X}_4 = 34.2$				

*Significant differences at $p < .05$.
**Significant differences at $p < .01$.

Table D.4

Differences in Mean Distances for Interaction of Race of Instructor by Sex of Instructor

	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	$\bar{X}_4$
white male instructors $\bar{X}_1 = 34.0$		**3.9	**6.1	**7.8
white female instructors $\bar{X}_2 = 30.1$			2.2	**4.0
black male instructors $\bar{X}_3 = 27.9$				1.7
black female instructors $\bar{X}_4 = 26.2$				

**Significant differences at $p < .01$.

Table D.5

Differences in Mean Distances for Interaction of Race of Student by Sex of Student by Sex of Instructor

	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	$\bar{X}_4$	$\bar{X}_5$	$\bar{X}_6$	$\bar{X}_7$	$\bar{X}_8$
white male students with male instructors $\bar{X}_1 = 27.4$		0.5	**8.1	**5.6	2.3	0.5	1.0	**5.9
white female students with male instructors $\bar{X}_2 = 27.9$			**7.6	**5.1	2.8	0.0	1.5	**5.4
black male students with male instructors $\bar{X}_3 = 35.5$				2.5	**10.4	**7.6	**9.1	2.2
black female students with male instructors $\bar{X}_4 = 33.0$					**7.9	**5.1	**6.6	0.3
white male students with female instructors $\bar{X}_5 = 25.1$						2.8	1.3	**8.2
white female students with female instructors $\bar{X}_6 = 27.9$							1.5	**5.9
black male students with female instructors $\bar{X}_7 = 26.4$								**6.9
black female students with female instructors $\bar{X}_8 = 33.3$								

**Significant differences at $p < .01$.

Table D . 6

Differences in Mean Distances for Interaction

of Race of Student by Sex of Student by Mode of Instruction

	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	$\bar{X}_4$	$\bar{X}_5$	$\bar{X}_6$	$\bar{X}_7$	$\bar{X}_8$
white male students in lecture classes $\bar{X}_1 = 29.4$		3.5	**7.0	**6.7	*6.4	**6.6	3.9	0.7
white female students in lecture classes $\bar{X}_2 = 32.9$			3.5	3.3	**9.9	**10.1	**7.4	1.8
black male students in lecturecclasses $\bar{X}_3 = 36.4$				0.3	**13.3	**13.8	**8.9	*6.3
black female students in lecture classes $X_4 = 36.1$					**13.1	**13.3	**10.9	*6.3
white male students in interactive classes $X_5 = 23.0$						0.2	2.5	**7.1
white female students in interactive classes $X_6 = 22.8$							2.7	**7.3
black male students in interactive classes $X_7 = 25.5$								4.6
black female students in interactive classes $X_8 = 30.1$								

*Significant differences at $p < .05$.

**Significant differences at $p < .01$.

Table D .7

Differences in Mean Distances for Interaction

of Race of Student by Race of Instructor by Sex of Instructor

	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	$\bar{X}_4$	$\bar{X}_5$	$\bar{X}_6$	$\bar{X}_7$	$\bar{X}_8$
white students with white male instructors $\bar{X}_1 = 26.4$		2.2	2.5	1.4	**15.2	**8.7	0.5	1.9
white students with white female instructors $\bar{X}_2 = 24.2$			**4.7	**3.6	**17.2	**10.9	2.7	0.3
white students with black male instructors $\bar{X}_3 = 28.9$				1.1	**12.7	**6.2	2.0	**4.4
white students with black female instructors $\bar{X}_4 = 27.8$					**13.8	**7.3	0.9	**3.3
black students with white male instructors $\bar{X}_5 = 41.6$						**6.5	**14.7	**17.1
black students with white female instructors $\bar{X}_6 = 35.1$							**10.2	**10.6
black students with black male instructors $\bar{X}_7 = 26.9$								2.4
black students with black female instructors $\bar{X}_8 = 24.5$								

**Significant differences at $p < .01$.

Table D.8

Differences in Mean Distances for Interaction

of Race of Student by Sex of Student by Race of Instructor by Sex of Instructor

	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	$\bar{X}_4$	$\bar{X}_5$	$\bar{X}_6$	$\bar{X}_7$	$\bar{X}_8$	$\bar{X}_9$	$\bar{X}_{10}$	$\bar{X}_{11}$	$\bar{X}_{12}$	$\bar{X}_{13}$	$\bar{X}_{14}$	$\bar{X}_{15}$	$\bar{X}_{16}$
$\bar{X}_1$ = white male student w/ white male instructor = 27.9		3.0	**14.1	**13.3	**4.4	1.1	3.2	**10.5	1.1	3.0	1.2	3.1	1.3	1.1	**6.9	0.2
$\bar{X}_2$ = white female student w/ white male instructor = 24.9			**17.1	**16.3	1.4	1.9	0.2	**7.5	1.9	0.0	1.8	0.1	1.7	1.9	**3.9	2.8
$\bar{X}_3$ = black male student w/ white male instructor = 42.0				0.8	**18.5	**15.2	**10.3	**3.6	**15.2	**11.1	**12.9	**17.2	**15.4	**13.0	**21.0	**13.9
$\bar{X}_4$ = black female student w/ white male instructor = 41.2					**17.7	**14.4	**9.5	2.8	**14.4	**10.3	**12.1	**17.2	**14.6	**12.2	**20.2	**14.1
$\bar{X}_5$ = white male student w/ white female instructor = 23.5						3.3	**8.2	**14.9	3.3	**7.4	**5.6	1.3	3.1	**5.5	2.5	**4.6
$\bar{X}_6$ = white female student w/ white female instructor = 26.8							**4.9	**11.6	0.0	**4.1	2.3	2.0	0.2	2.2	**5.8	1.3
$\bar{X}_7$ = black male student w/ white female instructor = 31.7								**6.7	**4.9	0.8	2.6	**6.9	**5.1	2.7	**10.7	*3.6
$\bar{X}_8$ = black female student w/ white female instructor = 38.4									**12.6	**7.5	**9.3	**13.6	**11.8	**9.4	**17.4	**10.3
$\bar{X}_9$ = white male student w/ black male instructor = 26.8										**4.1	2.3	2.0	0.2	2.2	**5.8	1.4
$\bar{X}_{10}$ = white female student w/ black male instructor = 30.9											1.8	**6.1	**4.3	1.9	**9.9	2.8
$\bar{X}_{11}$ = black male student w/ black male instructor = 29.1												**4.3	2.5	0.1	**8.1	1.0

Table D.8 (continued)

Differences in Mean Distances for Interaction

of Race of Student by Sex of Student by Race of Instructor by Sex of Instructor

	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	$\bar{X}_4$	$\bar{X}_5$	$\bar{X}_6$	$\bar{X}_7$	$\bar{X}_8$	$\bar{X}_9$	$\bar{X}_{10}$	$\bar{X}_{11}$	$\bar{X}_{12}$	$\bar{X}_{13}$	$\bar{X}_{14}$	$\bar{X}_{15}$	$\bar{X}_{16}$
$\bar{X}_{12}$= black female student w/ black male instructor = 24.8													1.8	**4.2	**3.8	3.3
$\bar{X}_{13}$= white male student w/ black female instructor = 26.6														2.4	**5.6	1.3
$\bar{X}_{14}$= white female student w/ black female instructor = 29.0															**8.0	0.0
$\bar{X}_{15}$= black male student w/ black female instructor = 21.0																**7.1
$\bar{X}_{16}$= black female student w/ black female instructor = 28.1																

**Significant differences at $p < .01$.

APPENDIX E

ANALYSIS OF DEMOGRAPHIC DATA

A final analysis of data consisted of investigating four demographic factors of the subjects: age, number of children in family, perceived income level of family when subject was growing up, and location of domicile during early life of subject.

Age

Range, mean, median, mode, and standard deviation of ages were computed for all four categories of subjects: white males, white females, black males, and black females. Table 1 below shows these.

Table E.1

Age of Subjects

Category[a]	Range	Mean	Median	Mode	Standard Deviation
White Males	19 - 48	25.32	24	24	5.38
White Females	19 - 52	25.10	23	22	6.93
Black Males	19 - 25	21.14	21	20, 21	1.36
Black Females	18 - 25	20.66	21	20	1.35

[a] $n = 50$ for each category

Number of Children in Family

Table 2 below shows the mean and modal number of children in the families in which subjects in this study were reared.

Table E.2

Mean and Modal Number of Children in Family

Category[a]	Mean	Mode
White Males	3.34	3
White Females	3.12	2
Black Males	4.16	6
Black Females	4.12	4

[a] n = 50 for each category

Table E.3

Position Among Siblings

Category[a]	First Born	Middle Born	Last Born	Only Child
White Males	23	14	10	3
White Females	23	9	16	2
Black Males	14	26	8	2
Black Females	18	22	5	5

[a] n = 50 for each category

Income Level

In response to the question, "When you were in elementary school, how would you rate the income level of the family in which you were reared?", subjects answered as shown in Table 4.

Table E.4

Income Level of Subjects' Families

Category[a]	Poor	Lower Middle	Middle	High Middle	Wealthy
White Males	1	19	26	4	0
White Females	4	8	29	9	0
Black Males	8	23	16	3	0
Black Females	7	13	24	4	2

[a] $n = 50$ for each category

Domicile during Early Life

In response to the question, "Where did you spend most of the first 12 years of your life?" (state, or country if outside United States), subjects responded in the way shown in Table 5.

Table E 5

Domicile during First 12 Years of Subjects' Lives

Category[a]	Texas	Outside Texas	Outside United States
White Males	34	15	1
White Females	30	15	5
Black Males	41	6	3
Black Females	44	6	0

[a] n = 50 for each category

Summary of Demographic Data Provided by Subjects

Analyses of demographic data showed that whites were somewhat older than blacks in this study, whites had fewer siblings than blacks; while whites were more likely to be first borns, blacks were more likely to be middle borns. Three categories of subjects perceived their families income level to be middle; most black males perceived their families' income level to be lower middle. Most of the subjects in this study had spent their first 12 years in Texas.

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